

REMARKS

Claims 1, 2, 4-10 and 13-20 are pending in the Application and are now presented for examination. Claims 1, 10 and 16 have been amended. Claims 3, 11 and 12 have been cancelled, without prejudice and without disclaimer of subject matter. No new matter has been added.

Claims 11, 10 and 16 are independent.

**Claim Rejections – 35 U.S.C. §103**

Claims 1, 10 and 15

On page 3 of the Office Action, Claims 1, 10 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,697,373 to Sandstrom (“Sandstrom”) in view of U.S. Patent No. 5,745,837 to Fuhrmann *et al.* (“Fuhrmann”). Applicants respectfully traverse the rejections.

Independent Claims 1 and 10

Amended independent Claims 1 and 10 recite a “utilization metric determined by dividing an average number of frames per second by a maximum number of frames per second allocated to the service” and “allocating additional bandwidth... such that the utilization metrics of the services are made approximately equal to each other.” These features are not disclosed or suggested by the cited portions of Sandstrom and Fuhrmann, whether considered individually or in combination.

Sandstrom describes an optical network that dynamically allocates connections based on available capacity of a connection in the presence of contention by different services.

Sandstrom, col. 14, ll. 53-61. More particularly, Sandstrom describes dynamic adjustment of capacity by automatically adding and removing paths to and from connections based on volumes of the packet traffic flows between interfaces. Sandstrom, col. 2, ll. 59-65. Sandstrom does not teach or suggest computing a utilization metric by dividing an average number of frames per second to a maximum number of frames per second allocated to the service and allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other.

Fuhrmann describes static allocation of bandwidth for a Customer Premises Equipment (CPE) during establishment of a connection. Dynamic allocation occurs during use of a connection. Aggregate peak bandwidth may exceed the maximum possible bandwidth for a given connection. Accordingly, bandwidth reserved for one under-utilized connection may temporarily be allocated to another over-utilized connection. Thus, if use of bandwidth by a connection drops below a threshold, bandwidth that was allocated to that connection may be reassigned to another connection. Similarly, if traffic on a connection increase above a threshold, then additional bandwidth will be allocated to the connection if additional bandwidth is available. Traffic is determined by counting cells transmitted by the CPE every 10 milliseconds. Fuhrmann, col. 45, l. 39-col. 46, l. 30. Fuhrmann does not teach or suggest computing a utilization metric by dividing an average number of frames per second to a maximum number of frames per second allocated to the service and allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other.

Therefore, the cited portions of Sandstrom and Fuhrmann, whether considered individually or in combination, fail to teach or suggest a “utilization metric determined by dividing an average number of frames per second to a maximum number of frames per second allocated to the service” and “allocating additional bandwidth... such that the utilization metrics of the services are made approximately equal to each other,” as recited in Claims 1 and 10. Hence, Claims 1 and 10 are allowable.

Claim 15

Claim 15 depends directly from Claim 10, as discussed above. Claim 15 recites additional limitations which, in conformity with the features of corresponding independent Claim 10, are not disclosed or suggested by the art of record. Claim 15 is therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

Claims 6, 8 and 13

On page 5 of the Office Action, Claims 6, 8 and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Sandstrom in view of Fuhrmann and in view of U.S. Patent No. 6,144,636 to Aimoto (“Aimoto”).

Claims 6 and 8

Claims 6 and 8 depend from Claim 1. As explained above, Sandstrom and Fuhrman fail to teach or suggest at least one element of Claim 1. Aimoto fails to teach or suggest the elements of Claim 1 not disclosed or suggested by Sandstrom and Fuhrmann. For example, Aimoto fails to teach or suggest a “utilization metric determined by dividing an average number of frames per second by a maximum number of frames per second allocated to the service” and “allocating

additional bandwidth... such that the utilization metrics of the services are made approximately equal to each other,” as recited in claim 1. Aimoto describes comparing use of a packet buffer to a threshold to indicate congestion of a connection. Aimoto, Abstract. Aimoto does not teach or suggest allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other. Therefore, Sandstrom, Fuhrmann, and Aimoto, whether considered individually or in combination, fail to teach or suggest at least one element of Claim 1, from which Claims 6 and 8 depend. Hence, Claims 6 and 8 are allowable at least by virtue of their dependence from an allowable claim.

Further, Claims 6 and 8 recite additional elements not disclosed or suggest by the cited art. For example, the cited art does not teach or suggest that “the additional bandwidth allocated to one of the services is a granularity of an STS-1 path,” as recited in Claim 6. The Office relies on Aimoto, FIG. 4, col. 3, ll. 56-67, and col. 4, ll. 1-3, as disclosing this element. Office Action, page 5. However, these cited passages only describe allocation of bandwidth based on a congestion determination. For at least this additional reason, Claim 6 is allowable. The individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

### Claim 13

Claim 13 depends from Claim 10. As explained above, Sandstrom and Fuhrman fail to teach or suggest at least one element of Claim 10. Aimoto fails to teach or suggest the elements of Claim 10 not disclosed or suggested by Sandstrom and Fuhrmann. For example, Aimoto fails to teach or suggest a “utilization metric determined by dividing an average number of frames per second by a maximum number of frames per second allocated to the service” and “allocating

additional bandwidth... such that the utilization metrics of the services are made approximately equal to each other,” as recited in claim 10. Aimoto describes comparing use of a packet buffer to a threshold to indicate congestion of a connection. Aimoto, Abstract. Aimoto does not teach or suggest allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other. Therefore, Sandstrom, Fuhrmann, and Aimoto, whether considered individually or in combination, fail to teach or suggest at least one element of Claim 10, from which Claim 13 depends. Hence, Claim 13 is allowable at least by virtue of their dependence from an allowable claim.

Claim 13 recites additional limitations which, in conformity with the features of corresponding independent Claim 10, are not disclosed or suggested by the art of record. Claim 13 is therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

#### Claims 16-18

On page 7 of the Office Action, Claims 16-18 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication 2004/0179519 to Bruckman *et al.* (“Bruckman”) in view of Sandstrom and in view of Fuhrmann.

#### Independent Claim 16

Amended independent Claim 16 recites a “utilization metric determined by dividing an average number of frames per second by a maximum number of frames per second allocated to the service” and “balancing bandwidth... such that the utilization metrics of the services are made approximately equal to each other.” This feature is not disclosed or suggested by the cited

portions of Bruckman, Sandstrom and Fuhrman, whether considered individually or in combination.

Bruckman describes using Link Capacity Adjustment Schemes (LCAS) to increase or decrease the capacity of a container in a SONET/SDH link that employs Virtual Concatenated Signals (VCS). Bruckman, paragraph 5. Bruckman fails to teach or suggest computing a utilization metric by dividing an average number of frames per second by a maximum number of frames per second allocated to the service and allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other.

Sandstrom describes an optical network that dynamically allocates connections based on available capacity of a connection in the presence of contention by different services. Sandstrom, col. 14, ll. 53-61. More particularly, Sandstrom describes dynamic adjustment of capacity by automatically adding and removing paths to and from connections based on volumes of the packet traffic flows between interfaces. Sandstrom, col. 2, ll. 59-65. Sandstrom does not teach or suggest computing a utilization metric by dividing an average number of frames per second by a maximum number of frames per second allocated to the service and allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other.

Fuhrmann describes static allocation of bandwidth for a Customer Premises Equipment (CPE) during establishment of a connection. Dynamic allocation occurs during use of a connection. Aggregate peak bandwidth may exceed the maximum possible bandwidth for a given connection. Accordingly, bandwidth reserved for one under-utilized connection may

temporarily be allocated to another over-utilized connection. Thus, if use of bandwidth by a connection drops below a threshold, bandwidth that was allocated to that connection may be reassigned to another connection. Similarly, if traffic on a connection increase above a threshold, then additional bandwidth will be allocated to the connection if additional bandwidth is available. Traffic is determined by counting cells transmitted by the CPE every 10 milliseconds. Fuhrmann, col. 45, l. 39-col. 46, l. 30. Fuhrmann does not teach or suggest computing a utilization metric by dividing an average number of frames per second by a maximum number of frames per second allocated to the service and allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other.

Therefore, the cited portions of Bruckman, Sandstrom and Fuhrmann, whether considered individually or in combination, fail to teach or suggest a “utilization metric determined by dividing an average number of frames per second to a maximum number of frames per second allocated to the service” and “balancing bandwidth... such that the utilization metrics of the services are made approximately equal to each other,” as in Claim 16. Hence, Claim 16 is allowable.

#### Claims 17 and 18

Claims 17 and 18 are allowable at least by virtue of their dependence from allowable Claim 16. Claims 17 and 18 recite additional limitations which, in conformity with the features of corresponding independent Claim 16, are not disclosed or suggested by the art of record. Claims 17-18 are therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

Claims 2 and 4

On page 10 of the Office Action, Claims 2 and 4 are rejected under 35 U.S.C. §103(a) as being unpatentable over Sandstrom in view of Fuhrmann and further in view of U.S. Patent No. 6,498,782 to Branstad *et al.* (“Branstad”).

Claims 2 and 4 depend from Claim 1. As explained above, Sandstrom and Fuhrman fail to teach or suggest at least one element of Claim 1. Branstad fails to teach or suggest the elements of Claim 1 not disclosed or suggested by Sandstrom and Fuhrmann. For example, Branstad fails to teach or suggest a “utilization metric determined by dividing an average number of frames per second to a maximum number of frames per second allocated to the service” and “allocating additional bandwidth... such that the utilization metrics of the services are made approximately equal to each other,” as recited in claim 1. Branstad describes use of an Ethernet communications adapter. Branstad, col. 3, ll. 52-56. Branstad also discloses controlling a rate of packet transmission. Branstad, col. 4, ll. 46-57. Branstad does not teach or suggest allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other. Therefore, Sandstrom, Fuhrmann, and Branstad, whether considered individually or in combination, fail to teach or suggest at least one element of Claim 1, from which Claims 2 and 4 depend. Hence, Claims 2 and 4 are allowable at least by virtue of their dependence from an allowable claim.

Claims 2 and 4 recite additional limitations which, in conformity with the features of corresponding independent Claim 1, are not disclosed or suggested by the art of record. Claims 2 and 4 are therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.



Claims 5 and 9

On page 11 of the Office Action, Claims 5 and 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Sandstrom, in view of Fuhrmann, and Branstad, and in view of Aimoto.

Claims 5 and 9 depend from Claim 1. As explained above, Sandstrom and Fuhrman fail to teach or suggest at least one element of Claim 1. Aimoto fails to teach or suggest the elements of Claim 1 not disclosed or suggested by Sandstrom and Fuhrmann. For example, Aimoto fails to teach or suggest a “utilization metric determined by dividing an average number of frames per second by a maximum number of frames per second allocated to the service” and “allocating additional bandwidth... such that the utilization metrics of the services are made approximately equal to each other,” as recited in Claim 1. Aimoto describes comparing use of a packet buffer to a threshold to indicate congestion of a connection. Aimoto, Abstract. Aimoto does not teach or suggest computing a utilization metric by dividing an average number of frames per second by a maximum number of frames per second allocated to the service and allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other. Therefore, Sandstrom, Fuhrmann, and Aimoto, whether considered individually or in combination, fail to teach or suggest at least one element of Claim 1, from which Claims 5 and 9 depend. Hence, Claims 5 and 9 are allowable at least by virtue of their dependence from an allowable claim.

Claims 5 and 9 recite additional limitations which, in conformity with the features of corresponding independent Claim 1, are not disclosed or suggested by the art of record. Claims 5 and 9 are therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

Claim 14

On page 13 of the Office Action, Claim 14 is rejected under 35 U.S.C. §103(a) as being unpatentable over Sandstrom, in view of Fuhrmann, and Aimoto, and in view of Branstad.

Claim 14 depends from Claim 10. As explained above, Sandstrom and Fuhrman fail to teach or suggest at least one element of Claim 10. Aimoto and Branstad fail to teach or suggest the elements of Claim 10 not disclosed or suggested by Sandstrom and Fuhrmann. For example, Aimoto and Branstad fail to teach or suggest a “utilization metric determined by dividing an average number of frames per second by a maximum number of frames per second allocated to the service” and “allocating additional bandwidth... such that the utilization metrics of the services are made approximately equal to each other,” as recited in claim 10. Aimoto describes comparing use of a packet buffer to a threshold to indicate congestion of a connection. Aimoto, Abstract. Aimoto does not teach or suggest computing a utilization metric by dividing an average number of frames per second by a maximum number of frames per second allocated to the service and allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other. Branstad describes use of an Ethernet communications adapter. Branstad, col. 3, ll. 52-56. Branstad also discloses controlling a rate of packet transmission. Branstad, col. 4, ll. 46-57. Branstad does not teach or suggest computing a utilization metric by dividing an average number of frames per second by a maximum number of frames per second allocated to the service and allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other. Therefore, Sandstrom, Fuhrmann, Aimoto, and Branstad, whether considered individually or in combination, fail to teach or suggest at least one element

of Claim 10, from which Claim 14 depends. Hence, Claim 14 is allowable at least by virtue of its dependence from an allowable claim.

Claim 14 depends directly from Claim 10, as discussed above. Claim 14 recites additional limitations which, in conformity with the features of corresponding independent Claim 10, are not disclosed or suggested by the art of record. Claim 14 is therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

Claim 7

On page 14 of the Office Action, Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Sandstrom, and in view of Fuhrmann, and in view of Bruckman.

Claim 7 depends from Claim 1. As explained above, Sandstrom and Fuhrman fail to teach or suggest at least one element of Claim 1. Bruckman fails to teach or suggest the elements of Claim 1 not disclosed or suggested by Sandstrom and Fuhrmann. For example, Bruckman fails to teach or suggest a “utilization metric determined by dividing an average number of frames per second by a maximum number of frames per second allocated to the service” and “allocating additional bandwidth... such that the utilization metrics of the services are made approximately equal to each other,” as recited in claim 1. Bruckman describes using Link Capacity Adjustment Schemes (LCAS) to increase or decrease the capacity of a container in a SONET/SDH link that employs Virtual Concatenated Signals (VCS). Bruckman, paragraph 5. Bruckman fails to teach or suggest computing a utilization metric by dividing an average number of frames per second by a maximum number of frames per second allocated to the service and allocating bandwidth among services such that the average number of frames per

second of each of the services are made approximately equal to each other. Therefore, Sandstrom, Fuhrmann, and Bruckman, whether considered individually or in combination, fail to teach or suggest at least one element of Claim 1, from which Claim 7 depends. Hence, Claim 7 is allowable at least by virtue of their dependence from an allowable claim.

Claim 7 recites additional limitations which, in conformity with the features of corresponding independent Claim 1, are not disclosed or suggested by the art of record. Claim 7 is therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

#### Claim 19

On page 15 of the Office Action, Claim 19 is rejected under 35 U.S.C. §103(a) as being unpatentable over Bruckman, in view of Sandstrom and Fuhrmann, and further in view of U.S. Patent Publication No. 2004/0057453 to Montgomery, Jr. (“Montgomery”).

Claim 19 depends from Claim 16. As explained above, Bruckman, Sandstrom, and Fuhrmann fail to teach or suggest at least one element of Claim 16. Montgomery fails to teach or suggest the elements of Claim 16 not disclosed or suggested by Bruckman, Sandstrom and Fuhrmann. For example, Bruckman fails to teach or suggest a “utilization metric determined by dividing an average number of frames per second by a maximum number of frames per second allocated to the service” and “balancing bandwidth... such that the utilization metrics of the services are made approximately equal to each other,” as recited in Claim 16. Montgomery shows a linear network and a ring network. Montgomery, paragraph 57. Montgomery fails to teach or suggest computing a utilization metric by dividing an average number of frames per second by a maximum number of frames per second allocated to the service and allocating

bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other. Therefore, Bruckman, Sandstrom, Fuhrmann, and Montgomery, whether considered individually or in combination, fail to teach or suggest at least one element of Claim 16, from which Claim 19 depends. Hence, Claim 19 is allowable at least by virtue of their dependence from an allowable claim.

Claim 19 recites additional limitations which, in conformity with the features of corresponding independent Claim 16, are not disclosed or suggested by the art of record. Claim 19 is therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

#### Claim 20

On page 16 of the Office Action, Claim 20 is rejected under 35 U.S.C. §103(a) as being unpatentable over Bruckman, in view of Sandstrom and Fuhrmann, and further in view of Branstad.

Claim 20 depends from Claim 16. As explained above, Bruckman, Sandstrom and Fuhrmann fail to teach or suggest at least one element of Claim 16. Branstad fails to teach or suggest the elements of Claim 16 not disclosed or suggested by Bruckman, Sandstrom and Fuhrmann. For example, Branstad fails to teach or suggest a “utilization metric determined by dividing an average number of frames per second to a maximum number of frames per second allocated to the service” and “balancing bandwidth... such that the utilization metrics of the services are made approximately equal to each other,” as recited in Claim 16. Branstad describes use of an Ethernet communications adapter. Branstad, col. 3, ll. 52-56. Branstad also discloses controlling a rate of packet transmission. Branstad, col. 4, ll. 46-57. Branstad does not teach or

suggest computing a utilization metric by dividing an average number of frames per second by a maximum number of frames per second allocated to the service and allocating bandwidth among services such that the average number of frames per second of each of the services are made approximately equal to each other. Therefore, Bruckman, Sandstrom, Fuhrmann, and Branstad, whether considered individually or in combination, fail to teach or suggest at least one element of Claim 16, from which Claim 20 depends. Hence, Claim 20 is allowable at least by virtue of its dependence from an allowable claim.

Claim 20 depends directly from Claim 16, as discussed above. Claim 20 recites additional limitations which, in conformity with the features of corresponding independent Claim 16, are not disclosed or suggested by the art of record. Claim 20 is therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

For all of the above reasons, the claim objections are believed to have been overcome placing the pending claims in condition for allowance, and reconsideration and allowance thereof is respectfully requested.

The Examiner is encouraged to telephone the undersigned to discuss any matter that would expedite allowance of the present application.

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The Commissioner is hereby authorized to credit overpayments or charge payment of any additional fees associated with this communication to Deposit Account No. 502104.

Respectfully submitted,

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By: /Alan M. Weisberg/

Alan M. Weisberg  
Reg. No.: 43,982  
Attorney for Applicants  
Christopher & Weisberg, P.A.  
200 East Las Olas Boulevard, Suite 2040  
Fort Lauderdale, Florida 33301  
**Customer No. 31292**  
Tel: (954) 828-1488  
Fax: (954) 828-9122  
email: ptomail@cwiplaw.com

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